R.10.12.007 Storage OIR
Energy Storage Cost-Effectiveness

March 25, 2013

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Energy Division, CPUC

Agenda

Opening Remarks	**9:30**
EPRI (I)	**10:00**
Lunch	**Noon**
EPRI (2)	**1:00**
DNV KEMA	**2:00**
Closing Remarks	**4:00**
Adjourn	**4:30**

Summary of AB 2514

- Directed CPUC to open a proceeding to:
  - Adopt procurement targets, *if appropriate,* for each LSE to procure viable & cost-effective energy storage
    - To be achieved by EOY 2015 & EOY 2020
  - Consider policies to encourage deployment of energy storage
- Deadline for CPUC decision by October 1, 2013
- CPUC to re-evaluate its determinations every three years

Energy Storage OIR R10-12-007

July 9th, 2010
PPD White Paper on Energy Storage

September 29th, 2010
AB 2514 is enacted

December 16th, 2010
OIR 10-12-007 issued

March 9th, 2011
Initial Workshop

April 21st, 2011
PHC

May 31, 2011
Scoping Memo

June 28th, 2011
Workshop

July 31st, 2011
Barriers Workshop

Phase 1

December 12, 2011
Staff Proposal Released

Jan 31, 2012
Parties Comments

Feb 20, 2012
Reply Comments

March 30, 2012
Final Staff Proposal

Q1/Q2 2012

Aug. 2, 2012
ALJ Decision
D12-08-016

Phase 2

Sept. 4, 2012
PHC

Aug 20 – Dec 6, 2012
Workshops

January 4, 2013
Staff Interim
Report issued

We are here
March 2013

Feb. 4 – 21, 2013
Comments/Replies
on Staff Interim
Report

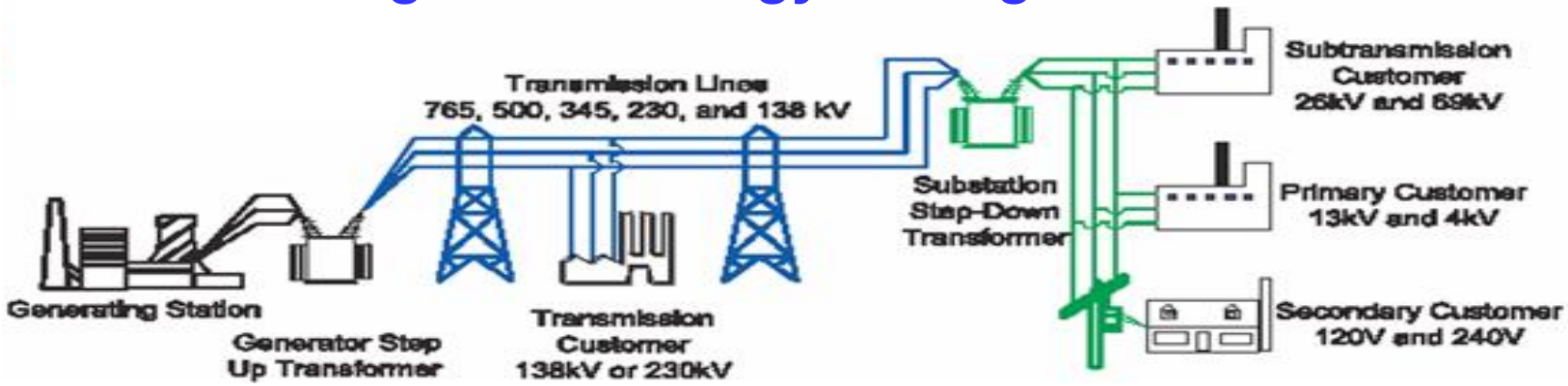
Summer 2013
Submission of
record of case

October 1st, 2013
Decision Target

December 31st, 2020
Proposed Second
Procurement target
(AB2514)

December 31st, 2015
Proposed First
Procurement target
(AB2514)

Breaking Down Energy Storage on the Grid



Bulk Generation		Transmission	Distribution	Behind-the-Meter
Renewable – Sited Storage	**Transmission Connected Bulk Storage**	**Transmission Grid Storage**	**Distribution Grid Storage**	**Customer-Sited Storage**
▪ CSP ▪ Wind + Storage	▪ A/S ▪ Peaker ▪ Load following	***FERC Jurisdiction***	▪ Substation Level Storage ▪ Distributed Peaker ▪ Community ES	▪ Bill mgt / PLS ▪ Power quality ▪ EV charging
←== Transmission-Connected ==→				

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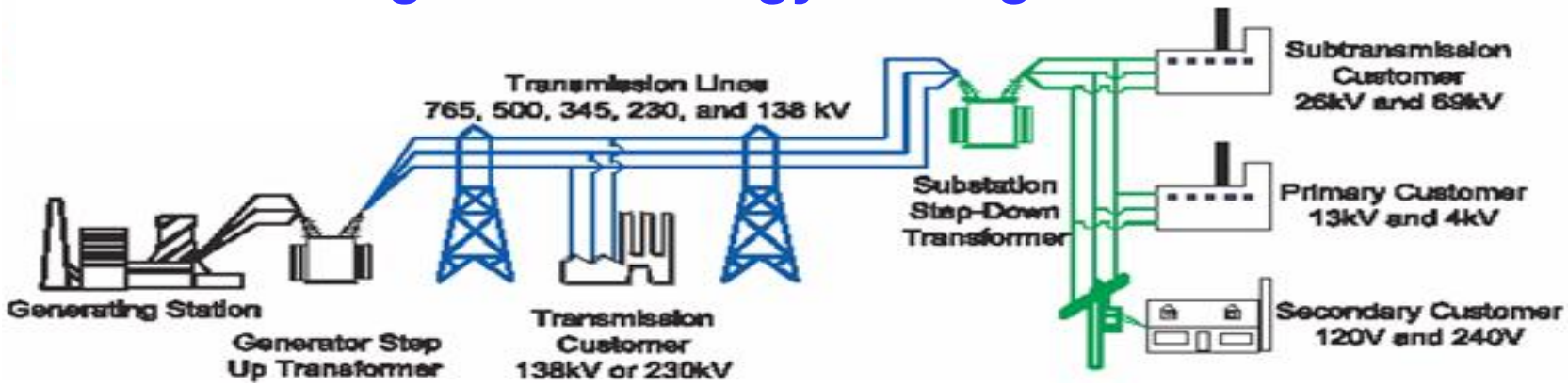

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←== **Transmission-Connected** ==→				

Storage "End Use" Framework

Category	Storage "End Use"
ISO/Market	• Frequency regulation • Spin/non-spin/replacement reserves • Ramp • Black start • Real time energy balancing • Energy price arbitrage • Resource adequacy
VER Generation	• Intermittent resource integration: wind (ramp/voltage support) • Intermittent resource integration: photovoltaic (time shift, voltage sag, rapid demand support) • Supply firming
Transmission/ Distribution	• Peak shaving: off-to-on peak energy shifting (operational) • Transmission peak capacity support (upgrade deferral) • Transmission operation (short duration performance, inertia, system reliability) • Transmission congestion relief • Distribution peak capacity support (upgrade deferral) • Distribution operation (Voltage Support/VAR Support) • Outage mitigation: micro-grid
Customer	• Time-of-use /demand charge bill management (load shift) • Power quality • Peak shaving (demand response), Back-up power

Storage Cost-Effectiveness Study

- Study effort launched in early Jan 2013
- Objective: To generate meaningful cost effectiveness insight quickly to inform consideration of various policy options for advancing deployment of energy storage systems
- Two independent parallel efforts
  - EPRI
  - DNV KEMA
- Staff developed work plan to drive study
  - Stakeholder review on 2/12/13
  - Assumptions based on stakeholder input
    - Technology cost/performance, market conditions, financial parameters
-

Points to Keep in Mind

- Does not establish a CPUC-endorsed storage CE “methodology”

- Limited in time and resources
- Not intended to be exhaustive, comprehensive, or precise
- Technology omission does not mean exclusion from consideration

- Large uncertainty in future market conditions
- Large error band in CE analysis
- Look at big picture, defer second/third order considerations

- An initial effort; more validation may be needed

Next Steps in Storage Proceeding

- April – June — Continue Cost-Effectiveness Analysis
- May - June — Revise Use Case documents

- June — Submission of record

- August - September — ALJ Proposed Decision
- September — Comments and Reply Comments

- October 2013 — Commission Decision

Thank You!

For further information related to Energy Storage Rulemaking R.10-12-007, please contact:

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